

## Course Objectives for Precalculus

When you successfully complete this course, you will be able to:

1. Recall and apply basic algebra skills without requiring a review.
2. Recall the definition of a function, basics of functions and their graphs, function operations, and function transformations.
3. Learn the basics of limits to help with the beginning of the calculus course.
4. Recognize various kinds of functions (including polynomial, rational, radical, exponential, and logarithmic functions), analyze their behavior, and use the properties of these functions to solve equations and application problems.
5. Define trigonometric functions; understand the right triangle trigonometry and unit circle.
6. Know and apply identities involving the trigonometric functions.
7. Recognize parametric equations and polar coordinates and use them to draw graphs and plot points.
8. Recognize the conic sections and their geometric properties.
9. Be self-disciplined and dependable through daily consistent work.

## Learning Objectives for Precalculus

1. Recall and apply basic algebra skills without requiring a review.
  - (a) Define sets of numbers.
  - (b) Simplify expressions using order of operations.
  - (b) Apply the properties of exponents to simplify and evaluate expressions.
  - (c) Apply the properties of rational exponents to simplify and evaluate expressions.
  - (d) Factor polynomials.
  - (e) Solve linear equations and inequalities.
  - (f) Solve quadratic equations and inequalities.
2. Recall the definition of a function, basics of functions and their graphs, function operations, and function transformations.
  - (a) Define relation and determine if a relation is a function.
  - (b) Find the domain, range, intercepts, and other basic information about a function and its graph.
  - (c) Understand piecewise functions.
  - (d) Use function operations to combine two or more functions.
  - (e) Apply function transformations to the graph or expression of a function.
3. Learn the basics of limits to help with the beginning of the calculus course.
  - (a) Understand limit notation.
  - (b) Find limits using tables and graphs.
  - (c) Find one-sided limits and use them to determine if a limit exists.
  - (d) Find limits using properties of limits.
  - (e) Find limits of fractional expressions.
4. Recognize various kinds of functions (including polynomial, rational, radical, exponential, and logarithmic functions), analyze their behavior, and use the properties of these functions to solve equations and application problems.
  - (a) Recognize the characteristics of parabola, determine a quadratic functions minimum or maximum value, use these properties to solve problems involving a quadratic function.
  - (b) Recognize the characteristics of a polynomial function, identify zeros and multiplicities.
  - (c) Apply the concepts learned about limits to rational functions.
  - (d) Be able to find inverses of functions.
  - (e) Recognize that exponential and logarithmic functions are inverses, recall the characteristics of these functions, and solve equations and application problems involving exponential and logarithmic functions.

5. Define trigonometric functions; understand the right triangle trigonometry and unit circle.

- (a) Recognize and use the vocabulary of angles.
- (b) Use right triangles to define and evaluate trigonometric functions.
- (c) Use a unit circle to define and evaluate trigonometric functions.
- (d) Understand the graphs of trigonometric functions.
- (e) Use the right angle trigonometry, unit circle and the graphs of trigonometric functions to define and evaluate inverse trigonometric functions.

6. Know and apply identities involving the trigonometric functions.

- (a) Use trigonometric identities to simplify expressions and to evaluate the trigonometric functions.
- (b) Use the trigonometric functions to solve triangles.

7. Recognize parametric equations and polar coordinates and use them to draw graphs and plot points.

- (a) Define the basic ideas behind parametric equations and use them to apply parametric equations in the concept of rolling wheels.
- (b) Define polar coordinates and be able to convert between Cartesian and polar coordinates.
- (c) Understand the basic curves in polar coordinates
- (d) Graph in polar coordinates and use graphs to recognize parametric representations of polar equations.
- (e) Understand the polar form of complex numbers.
- (f) Use the polar form of complex numbers to find powers and roots.

8. Recognize conic sections and their geometric properties.

- (a) Differentiate between four conic sections circle, ellipse, hyperbola, parabola using the standard and the general form of the equations.
- (b) Describe the terms center, foci, vertices, and directrix.
- (c) Graph the conic sections.